

REMARKS

The Advisory Action of November 11, 2005 (“Advisory Action”) and the Final Office Action dated April 19, 2005 (“Final Office Action”) have been carefully considered. According to the Advisory Action, Applicants’ Response to Final Office Action Under 37 C.F.R. §1.116 of October 19, 2005 was not entered. Reconsideration of this Application is respectfully requested in light of the above amendments and the following remarks.

Claims 1-8, 14-16, 18, 19 and 32-35 are pending in the application and were rejected by the Examiner. Claims 1, 18, 19, 32, 33 and 35 are amended with this response. After entry of this Amendment, claims 1-8, 14-16, 18, 19 and 32-35 will remain pending in this application.

Applicants note that amendments to the specification and drawings made herein are identical to those submitted in Applicants’ Response of October 19, 2005. In particular, the drawings have been amended as suggested by the Examiner, and the corresponding text in the specification has been amended to reflect the amended drawings. No new matter is added by way of these amendments, and their entry is respectfully requested.

Objections to the Drawings

The Examiner objected to the drawings under 37 CFR 1.83(a), and stated that the small volume device must be shown in the figures. Applicants disagree with this objection, and point out that the microfluidics substrate of Figure 2 is just one example of a small volume device. However, in order to be fully responsive, Applicants have amended Figure 2 to specifically shown that the substrate is a small volume device.

The specification has also been amended accordingly to clarify that the small volume device shown in FIG. 2 may be, for example, an array chip, an array plate, or an array slide. Support for these amendment may be found throughout the specification, for example on p. 3 at lines 29-32. No new matter is added by these amendments.

Rejections under 35 U.S.C. § 103(a)

Tateiwa (US 5,444,529)

Claims 1, 4-6 and 14-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tateiwa (US 5,444,529). The Office Action states that, while Tateiwa lacks specific reference to an array chip, array plate or an array slide, “it is very well known in the art to use an array chip, array plate or array slide for the purpose of inspecting the devices [i.e. the fluid contained in the devices] for unwanted particles or viewing multiple samples.” (Office Action at page 3)

Applicants respectfully traverse this rejection. The present claims recite methods for using resonance light scattering particles to determine a dynamic property of a fluid volume, and for analyzing fluid flow, in array chips, array chips or array slides. Independent claims 1 and 32 have been amended to point out that the particles used in the claimed method are resonance light scattering particles, which are described, for example, on page 10, line 16 to page 11, line 2 of the instant application. In stark contrast, Tateiwa discloses a method for using water drops to detect the presence fine dust particles on a semiconductor device. (See, e.g., Tateiwa at column 1, lines 15 - 18). In particular, Tateiwa discloses surrounding otherwise undetectable dust particles with condensed water and detecting diffuse light patterns scattered by the water (Tateiwa at column 1, lines 44-47). The dust particles themselves do not scatter a detectable amount of light (see e.g., Tateiwa at. col. 1, lines 38-47).

Applicants respectfully assert that Tateiwa does not teach or suggest determining a dynamic property of a fluid volume using resonance light scattering particles as claimed by applicants. Clearly, neither the unwanted dust particles nor the water drops of Tateiwa are resonance light scattering particles. In fact, Tateiwa includes no mention or suggestion of resonance light scattering particles at all.

Accordingly, for at least the reasons stated above, independent claim 1 is patentable over Tateiwa. Claims 4-6 and 14-16 ultimately depend from claim 1, and are therefore patentable over Tateiwa for at least the same reasons as claim 1.

Although not necessary in light of the arguments above, Applicants further respectfully contend that the Examiner’s specific rejection of claims 4-6 and 14-16 are without basis. For example, regarding claims 4 and 5, the Examiner states that “Tateiwa teaches probes are present in the fluid volume and the particle distribution is indicative of the distribution of the probes in

the fluid volume (col. 2 lines 11-27).” (Office Action at p. 4) Applicants disagree, and point out that the section of Tateiwa cited by the Examiner makes no mention of a probe of any kind. The section cites only a silicon substrate (item 1 of FIGS. 1-3), a particle attached to the silicon substrate (item 2), and a water drop surrounding the particle (3). The silicon substrate (1) is clearly not a probe, as it is the substrate to which the particle (3) is attached. The water drop is not a “probe in the fluid volume”, the water drop is the fluid volume. Finally, the particle (3) is not a probe - otherwise the Examiner’s above-captioned statement would be circular and nonsensical (i.e. “...the particle distribution is indicative of the distribution of *the particle* in the fluid volume).

With regard to claim 6, the Examiner contends that “Tateiwa teaches the dynamic property is uniformity of drying on a solid surface” and again cited column 2, lines 11-27 of Tateiwa (Office Action at p. 4). Applicants respectfully contend that the cited section of Tateiwa, as with the rest of Tateiwa, includes no mention, teaching or suggestion of a uniformity of drying as a property that is determined. Tateiwa teaches only condensation of water around a particle in order to detect the particle using a laser.

With regard to claims 14-16, the Examiner states that “Tateiwa teaches a plurality of features and has deposited on each feature a volume of 10pL to 2 microliters (3)”. Applicants respectfully disagree, and contend that Tateiwa teaches only a silicon substrate and, as discussed above, includes no teaching or suggestion of using a substrate comprising a plurality of features, e.g., an array chip, plate or slide.

For at least the foregoing reasons, Applicants respectfully request that the rejection of claims 1, 4-6 and 14-16 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Tateiwa in view of Webb (US 4,385,830)

Claims 2, 3, 7, 8, 18, 32 and 33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tateiwa in view of Webb (US 4,385,830). The Examiner contends that Tateiwa teaches the invention as claimed but lacks reference to: flow rate (regarding claims 2 and 32), measuring particle distribution (regarding claim 3), measuring flow pattern (regarding claim 7), measuring fluid mixing (regarding claim 8), and one particle comprising a plurality of distinguishable particles (regarding claims 18 and 33).

Claims 2, 3, 7, 8, 18 depend from claim 1, and therefore are patentable over the proposed combination of Tateiwa and Webb for at least the reasons specified above with respect to claim

1. In particular, the proposed combination does not teach or suggest any method for determination of a dynamic property of a fluid volume comprising detecting light scattered from at least one light resonance scattering particle in the fluid volume. In contrast, Webb discloses an optical system for measurement of vorticity in a fluid using transparent particles having embedded planar crystal mirrors for measuring particle rotation rate. Webb does not cure the above-described deficiencies of Tateiwa with respect to resonance light scattering particles, for example.

Independent claim 32 has also been amended to point out that the light scattering particles are resonance light scattering particles. The proposed combination simply does not teach or suggest illuminating a suspension of resonance light scattering particles and/or detecting such resonance light scattering particles as an indication of fluid flow.

Accordingly, Applicants respectfully request that the rejection of claims 2, 3, 7, 8, 18, 32 and 33 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Tateiwa in view of Webb and further in view of Dittrich (US 3,738,759)

Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Tateiwa in view of Webb and further in view of Dittrich (US 3,738,759). Claim 19 depends from claim 1 and therefore distinguishes over the proposed combination for at least the same reasons as claim 1. In particular the proposed combination does not teach or suggest any method for determination of a dynamic property of a fluid volume comprising detecting light scattered from at least one resonance light scattering particle in the fluid volume. Adding the teachings of Dittrich to intersect two fluid streams does not cure the above-described deficiencies of Tateiwa and Webb.

Accordingly, Applicants respectfully request that the rejection of claim 19 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.

Tateiwa in view of Webb and further in view of McDowell (US 5,905,568)

Claims 34 and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tateiwa in view of Webb and further in view of McDowell (US 5,905,568). Claims 34 and 35 depend from claim 32, and are patentable over the proposed combination for at least the same reasons as discussed above with respect to claim 32. Moreover, Applicants respectfully contend

that nothing in any of the references would motivate one to modify Tateiwa and combine the references as suggested by the Examiner.

Accordingly, Applicants respectfully request that the rejection of claims 34 and 35 under 35 U.S.C. § 103(a) be reconsidered and withdrawn.


Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. Applicants believe that the present application is in condition for allowance. Prompt and favorable consideration of this Reply is respectfully requested.

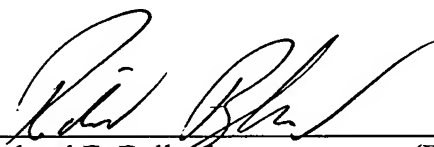
It is not believed that any fees are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional fees are required, then the Commissioner is authorized to charged any such fees to Jones Day Deposit Account No. 50-3013.

Respectfully submitted,

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Amendments to the Drawings

Please replace drawing sheet 2 of 3 with the attached Replacement Sheet, which is a corrected drawing sheet comprising the amended Figure 2 in compliance with 37 CFR 1.121(d). A marked-up copy showing the amendments to Figure 2 is also submitted herewith, and labeled as “Annotated Sheet”.

Figure 2 has been amended in accordance with the Examiner’s instructions, in order to more clearly show a small volume device. While the small volume device in the example shown in Figure 2 is a microfluidics substrate, the specification clearly states that a small volume devices may also be an array chip, an array plate, or an array slide (e.g., Application at p. 3, lines 29-32).